

SPECIFICATIONS

TGI-50kN type
Universal testing machine

SPEC.No. ENTGI4105C 1/9

Universal testing machine

1. General

The "TGI" type universal testing machine has developed with the concept of achieving "Fulfillment of function and simple operation".

Adopted with AC servo motor, high accurate measurement can be provided, that is, featuring high excellent accuracy in test speed and also realizing stable high speed data sampling.

Moreover, due to the Menu modes divided into each application, its design is fully considered to make easy operation.

You can make use of this testing machine for the strength test for various kinds of materials and inspection on products and so on, that is, in wide range of fields.

2. Specifications

2-1	Maximum test force	50 kN {5.099 tf} The maximum allowable test force for the main body of testing machine. The rated capacity of load cell applied will become the maximum test force actually.
2-2	Testing space	Tension and Compression test can be available at the lower section of movable crosshead. Upper tension type : Sold separately.
2-3	Allowable test force for test speed	50 kN {5.099 tf} in all of the test speed ranges.
2-4	Effective test width	420 mm(Attached with protection cover for lead screws.)
2-5	Movable crosshead stroke	Without installing the test jig and load cell: 1 015 mm Extension of stroke: Sold separately.
2-6	Speed range of movable crosshead	0.0005 mm/min ~ 500 mm/min 0.1 mm/min~500 mm/min →Setting can be made by the pitch of 0.1 mm/min among them. Less than 0.05mm/min will be 0.05,0.03,0.02,0.01, 0.005,0.003,0.002,0.001 and 0.0005. (9 steps)
2-7	Return speed	0.1 mm/min~750 mm/min optional setting can be made.
2-8	Manual speed	3 speeds of changeover method of HIGH,MIDDLE and LOW.
2-9	Setting method of speed	Input values with the operation panel.
2-10	Accuracy on speed	±0.1 % of setting speed

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2-11 Measurement of test force

Range of test force 2 kinds of selection method:
 AUTO : (1/1 ~ 1/250 of accuracy guaranteed range of Load cell)
 100 : (1/100 ~ 1/1000 of accuracy guaranteed range of Load cell)

Test force display 5 digits digital display (with — sign)
 Range AUTO : 0.2 N ~ 50.00 kN Resolution 1/5000
 With increase/decrease of test force, full scale of display, decimal position and display unit will change automatically.
 Range 100 : 0.05 N ~ 500.00 N Resolution 1/10000
 *Display of test force shall be changed depending to the load cell attached.

Measurement accuracy Standard accuracy : $\pm 1\%$ of indicated value
 (Range of 1/1 ~ 1/1000 of rated capacity of Load cell: 50N ~ 50 kN)
 High accuracy : $\pm 0.5\%$ of indicated value (Sold separately.)
 (Range of 1/1 ~ 1/1000 of rated capacity of Load cell: 50N ~ 50 kN)
 * No vibration where the testing machine is installed.

AD sampling 1 000 times/s

Display times 4 times/s

Peak/Break detection function After test is made, test force value of peak and the position value or test force value of Break point and the position value are displayed with the [PEAK/BREAK] key.

Auto zero function Automatic zero point adjustment with the [ZERO] key.

Measurement unit SI unit : mN, N, kN

Judgment of capacity of load cell Automatic judgment function applied

Analog output DC ± 5 V (Output connector : BNC female)
 Load resistance 5 k Ω or more, scaling function applied.
 Accuracy : $\pm 0.5\%$ F.S.
 Resolution : Approx. 1/4 000
 Output cable : Sold separately.

2-12 Measurement of position of movable crosshead

Position display 6 1/2 digits digital display (— sign applied)

Display range The minimum unit : 0.001 mm,
 The maximum display : $\pm 1\,999.999$ mm

Display resolution 0.001

Display unit mm

Zero reset Zero reset can be made at the optional position with the [RESET] key.

Analog output DC ± 5 V (output connector : BNC female)
 Load resistance 5 k Ω or more with scaling function attached.
 Accuracy : $\pm 0.5\%$ F.S.
 Resolution : Approx. 1/4 000
 Output cable : Sold separately.

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2 – 13	Cycle test function Setting method	Cycle test with the position value, cycle test with the test force value and also the cycle test can be available by the combination of the two. The maximum repeatability times 10 000 times The maximum repeatability speed 5 times /min
2 – 14	Break detection function	<p>Detects the sample detection and stops the operation of movable crosshead or makes it reversed to the 0 mm position automatically.</p> <ul style="list-style-type: none"> • Detects when the test force decreases suddenly more than ** % (0.04 % ~ 99.00 %) of the max. value in display range at present after exceeding 7 % of the max. value in display range at present, or also detects when the test force decreased less than 5 % of the max. value in display range at present. • Setting the movement of movable crosshead (stop, reverse and ignorance of detection) can be made at the time of break detection from Menu mode. • * % (Break sensitivity) can be set in the Menu mode optionally.
2 – 15	Safety device	
	EMERGENCY SW	When operated, makes the operation of movable crosshead stopped. (lock method)
	Overload limit	When the test force value reaches ± 102 % of rated capacity of load cell, this Overload limit outputs the signal of operation stop and makes the movable crosshead stopped. However, at the time of setting 100 times of range, it stops at ± 102 % of 100 times of full scale.
	Function of preparation for operation	Makes the servo OFF during the EMERGENCY SW and the Stroke limit operation are made, the power to the servo motor is cut. By inputting the SET SW attached to the main body of testing machine, you can feed power to the servo motor.
	Stroke limit	During the setting can be available at the optional upper/lower position within the movable range of movable crosshead, it makes the operation of movable crosshead stopped.
	Servo amplifier abnormal stop function:	During operation, outputs the signal of stop operation and makes the operation of movable crosshead stopped.
	Load cell protection function :	During the manual operation or return operation, this is the function to stop the operation of movable crosshead automatically when more than $\pm 102\%$ of 1/50 test force is applied. (Effective/Ineffective setting can be made with the Function F-008.)

*As for the above safety device, Alarm display will be shown during operation.

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- 2-16 Test condition registration function: Test conditions can be registered in the file up to 10 pcs at max. By reading the registered files, the test condition in the testing machine can be set automatically.
- 2-17 Communication function : Used in the communication with external devices such as personal computer and so on.
Standard Confirms to USB2.0.
You can also use with the standard of USB1.1.
(connector: B type female)
Connection USB connection port
No, of communication Transfer of test force and position value can be available in 100 times/s.
- 2-18 Keeping test condition Setting contents at the time of cutting off the power supply can be kept. However, operation condition will not be kept.
- 2-19 Horizontal adjustment Level adjusters that can be adjusted horizontally are attached at the bottom section of the testing machine.
- 2-20 Outline dimensions Width 900mm ×Height 1 507 mm (*)×Depth 510 mm
Wiring space for the connection of connector at the rear side of testing machine : 150 mm
* Excludes level adjuster.
- 2-21 Weight Approx. 310 kg
- 2-22 Power supply
Power supply voltage 3 phases AC200~230V +10%~-15%
Power consumption 2 kW
Frequency 50/60 Hz
- 2-23 Operational condition
Temperature : 5 °C ~ 40 °C
Humidity : 20 %RH ~ 80 %RH (Excludes frozen.)
- 2-24 Standard accessories
Tools 1 set (Tool box, hexagon wrench, plus driver)
Earth wire 5 m 1 pce
Power supply cable 5 m 1 pce
For AC 200 V, solderless terminal is attached to cable end.
Instruction manual 1 pce
USB driver CD-ROM 1 pce

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3. Functions sold separately (■ Applied □ Not applied.)

- High accuracy test force (TGI-LHP) ±0.5 % of indicated value
- USB communication cable (TGI-USB) A connector male ~B connector male
Length : 2 m
- Upper section tension type (TGI-UT) Make the test space of tension test to the upper section of movable crosshead.
- Stroke extension type (TGI-L**0) Extends the stroke of movable crosshead **0 mm.
- Extensive width type (TGI-W**0) Set effective width of test to **0 mm.
- Chuck adapter (TGE-CHB) Installation adapter for lower chuck for tension test. Used when less the 10kN of chuck is applied.
Accessories tools Hook for clamping up the chuck. (1 pce)
- Chuck adapter (TGE50-CHB) Installation adapter for lower chuck for tension test. Used when 20/50kN of chuck is applied.
Accessories tools Hook for clamping up the chuck. (1 pce)
- RS-232C communication function (TGI-232C)
Used for the communication with the external device such as a personal computer and so on.
(When the RS-232C communication function is installed, the USB interface can't be used.)

Standard	RS-232C
Communication times	Test force, position value can be transferred at 1 000 times/s.
Cable	RS-232C straight cable attached. (D-sub 9 pin female ~D-sub 9 pin male, length: 2 m)
- Analog output cable (CAC-124S-2M)
BNC cable (One side is Y terminal, 2 m)
- Remote control (TGI-RMT) Handy controller for external control.
External control "TEST START"·"RETURN"·"STOP"·"Manual UP"· "Manual DOWN"·"Manual speed SELECT"
Outline dimensions (W×H×D) 80 mm×125 mm×32 mm
Cable length 2 m
- Remote control (TGI-RMT-J) Handy controller for external control
External control "TEST START"·"RETURN"·"STOP"·"Manual UP"· "Manual DOWN"·"Manual speed SELECT" and "Jog dial"
Outline dimensions (W×H×D) :80 mm×180 mm×62 mm
Cable length 2 m

"When the remote control is selected, the external contact I/O (TGI-I/O) are required.

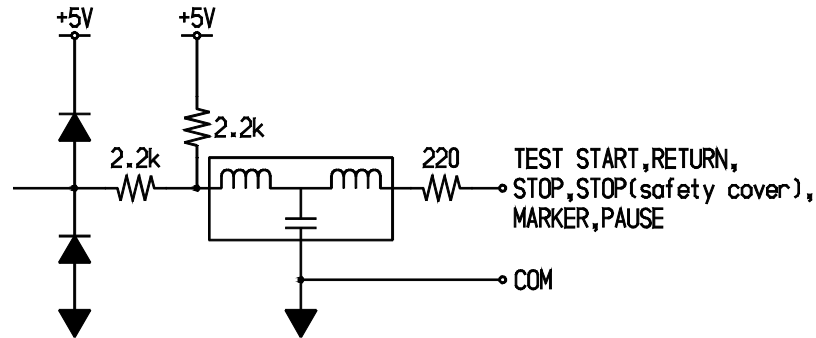
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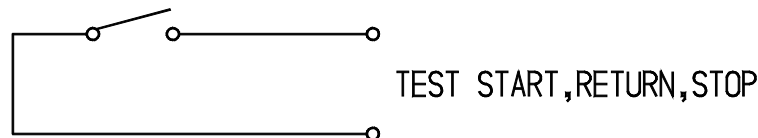
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- External control Input/Output (TGI-I/O)
 Contact input 6 points
 Input signal Input "TEST START" · "RETURN" · "STOP" · "STOP (safety cover)" · "MARKER" and "PAUSE".

Equivalent circuit for contact input section



- Contact output 3 points
 Output signal Outputs "TEST START" · "RETURN" and "STOP".
 Equivalent circuit for contact output section



- Specifications for contact input/output 1a contact
 AC125 V、0.4 A (resistance load)
 DC30 V、2 A (resistance load)

Connector pin layout Suitable plug : MR-16M

Pin No.	Signal name	Pin No.	Signal name
1	PAUSE (Input)	9	N.C.
2	MARKER (Input)	10	COM (Input)
3	RETURN (Input)	11	RETURN (Output)
4	TEST START (Input)	12	RETURN (Output)
5	STOP (Input)	13	TEST START (Output)
6	COM (Input)	14	TEST START (Output)
7	N.C.	15	STOP (Output)
8	N.C.	16	STOP (Output)

* Never connect with the N.C. pins.

Connector pin layout Suitable plug : R05-PB2M

Pin No.	Signal name
1	STOP (safety cover)
2	COM

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- Displacement measurement function (TGI-AMP)

For the display and each setting, the data processing software is required.

Line up Make selection from below: (Plural number can be selectable.)

 - TGI-AMP-01 strain : 1 mV/V, excitation voltage: DC12 V
 - TGI-AMP-02 strain : 1.5 mV/V, excitation voltage: DC3 V
 - TGI-AMP-04 voltage : DC0 V ~ DC5 V

Display section 5 digits display (–sign applied)

Display range –99 999 ~ 99 999

Measurement range Once

Measurement accuracy Standard accuracy : ±1 % of indicated value
High accuracy : ±0.5 % of indicated value (Sold separately.)
There may have the cases of changes of accuracy depending on the sensors used.

Measurement unit mm

Automatic zero function Attached as a standard.

Capacity judgment function Attached as a standard.

Calibration function Attached as a standard.

Analog output DC±5V (Output connector : BNC female)
Load resistance 5 kΩ or more, scaling function applied.
Accuracy : ±0.5 %F.S.
Resolution : Approx. 1/4 000
Cable : Sold separately.

- Instant creep test function Simple creep test function (TGI-CRP)

Makes test that keeps on loading the set test force to the sample.
Continues test until the “STOP” key is pressed.

Setting method Set from the Menu mode.

Setting contents Set sets force value : Test force value applied to the sample.
Creep control width : Setting PI control starting position (test force)

- Automatic load function (TGI-ALC)

Function that keeps increase of test force to be the constant one.

Setting method Set from the Menu mode.

Setting contents Arrival time : Time to arrive to the set test force. *** sec.
The Max. speed : The max speed during control *** mm/min

- Automatic cancel (TGI-LOAD)

Adjust the load to zero that occurred when the sample is chucked with the automatic control.

When the function is used, special data processor software is required.

Start of control Control with the data processor software.
During Control, other than the “STOP” signal will not be accepted.

End of Control End of Control can be made when the test force is zero or with the “STOP” signal.

NOTICE: ※Specifications and outline dimensions and so on which have printed may subject to change for the propose of improvement without notice.

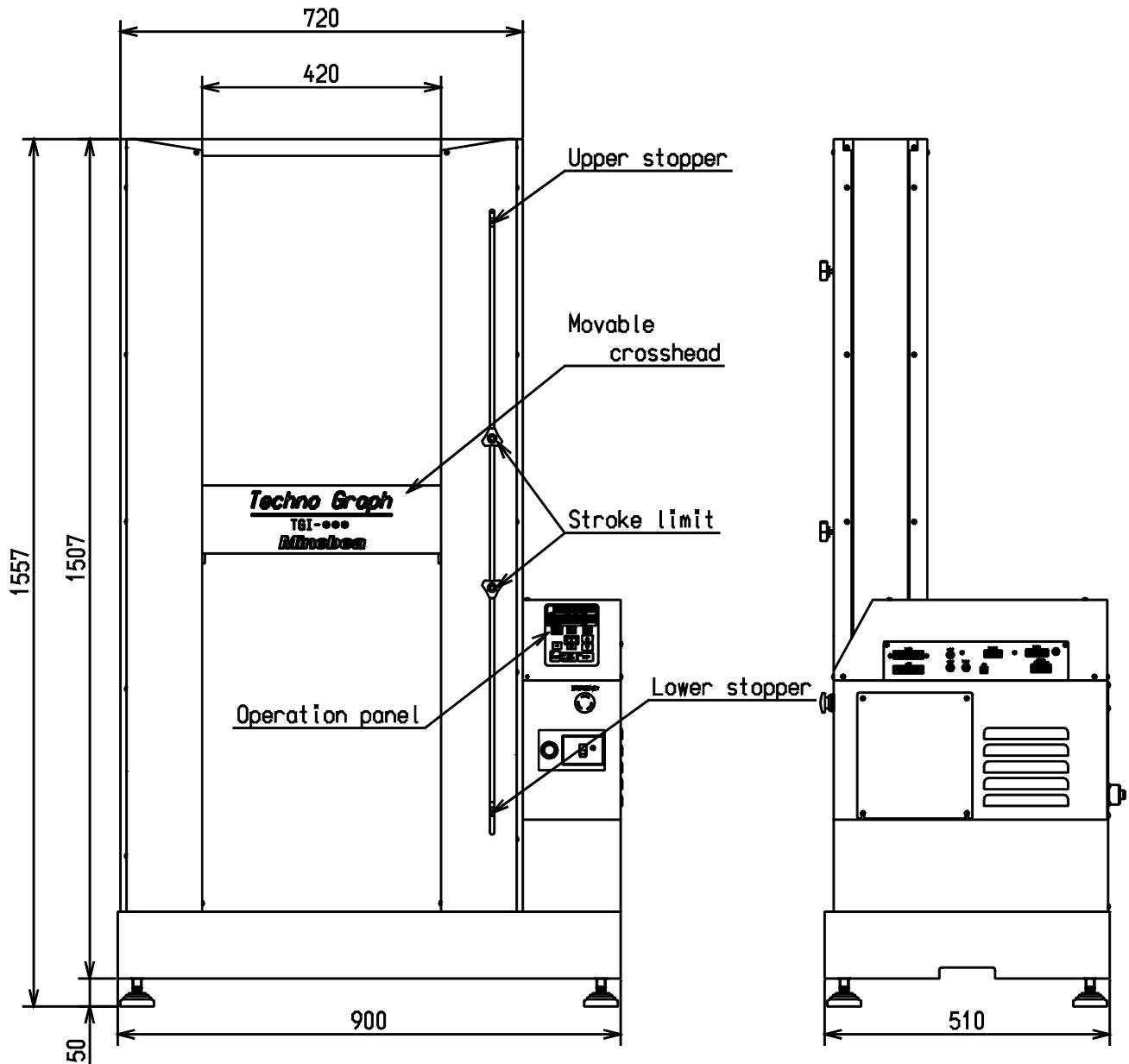
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Outline dimensions of testing machine



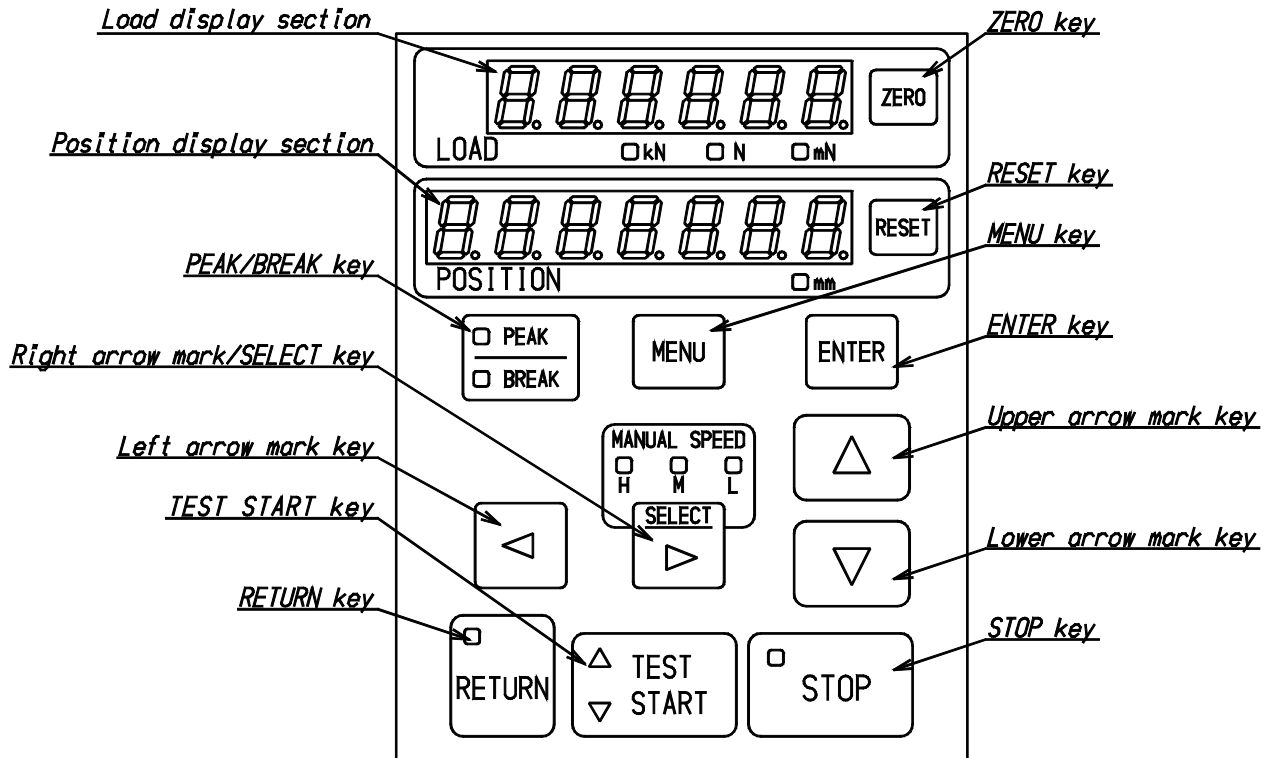
Unit : mm

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Outline of operational panel



Test force	Displays test force value, menu and alarm display.
Position display section	Displays position value, set value and alarm display.
ZERO key	Makes reset the test force to zero.
RESET key	Resets the position value to zero.
PEAK/BREAK key	On the test force display/Position display section each displays test force value of peak and position value each, and test force value and position value of break point can be shown.
MENU key	Changeover key to the Menu mode. Cancel key during the Menu is set.
ENTER key	Fixed key during the Menu is set.
Left arrow make key	Shifts the digit to the left during the Menu is set.
Right arrow mark/SELECT key	Shifts the digit to the right during the Menu is set.
MANUAL SPEED	Changes the speed (HIGH,MIDDLE,LOW) during the manual operation.
UPPER arrow mark key	During manual operation, makes the movable crosshead risen. During setting Menu, makes the value increased.
LOWER arrow mark key	During setting Menu, makes the Menu changed. During manual operation, makes the movable crosshead decreased.
RETURN key	During setting Menu, makes the menu changed.
TEST START key	Makes the movable crosshead reversed to the position 0 mm.
STOP key	Test shall be started by pressing the key. Test shall be started by pressing the key.